

THE REPORT

O F

Mess. ^{the younger} JOHN GRUNDY, LANGLEY EDWARDS,
and JOHN SMEATON, Engineers,

CONCERNING


The present ruinous State and Condition, of the River
WITHAM, and the Navigation thereof, from the
City of LINCOLN, thro' BOSTON, to it's Outfall into
the Sea ; And of the Fen Lands on both Sides the
said River.

Together with

Proposals and Schemes for Restoring, Improving, and Pre-
serving the said River and Navigation, And also for effect-
ing the Drainage of the said Fen Lands.

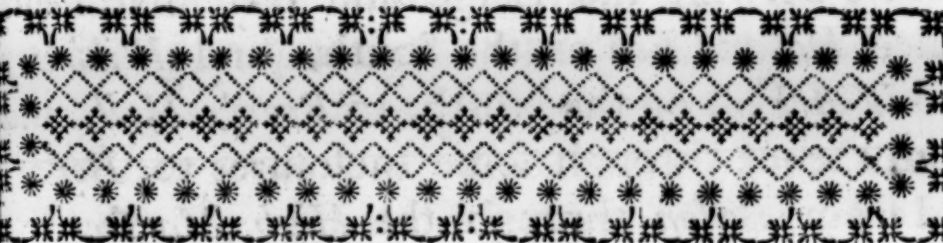
To which is annexed

A Plan, and proper Estimates of the Expences in perform-
ing the several Works recommended for those Purposes.



LINCOLN; PRINTED BY W. WOOD.





INTRODUCTION.

THE River *WITHAM* from *Lincoln* to *Boston* falls in a crooked Course through the Low Grounds of the several Lordships following on the South Side thereof, viz. *Lincoln, Canwick, Washinborough, Branston, Potter-Hanworth, Nocton, Dunston, Metherringham, Blankney, Marton, Timberland, Timberland-Thorpe, Walcot, Billingham, Billingham-Dales, and Dogdike to Chappel Hill*; And on the North Side through the Low Grounds of *Monks, Greetwell, Willingham, Fiskerton, Barlings, Stainfield, Bardney, Southrey, Tupholm, Bucknall, Horington, Stixwold, Swinesike, Woodball, Thornton, Kirkstead, Tatterball and Coningsby*: And from the said *Chappel*

Description of
the River *With-*
am

And it's Course
from Lincoln to
the Sea

Hill it runs in a very crooked and meandering Course betwixt the Large and Extensive Fens called *Holland Fen* on the South, and *Wildmore* and *West Fens* on the North, to *Room's Hall*, and from thence through some Inclosures to *Boston*, and from *Boston* through the *High Marshes* into the great Bay called *Metaris Estuarium*, The Distance from *Lincoln* to *Boston* by the old Course of this River is about 43 Miles.

It's antient State

Trade Heretofore
carried on
the said River

This River has formerly been a very good Navigation from it's Outfall at the *Scalp* to *Boston* (which is about 4 Miles) sufficiently capacious and deep to Navigate large Ships into the Town, and from thence to convey Barges, Keels and other Vessels to *Lincoln* almost at all times in the Year ; and a very extensive and advantageous branch of Commerce has, till of late Years, been carried on the said River, to the great benefit and advantage not only of the City of *Lincoln* and Town of *Boston*, but also of the several Towns and Villages adjoining upon and contiguous to it, through an extend of Country for many Miles in Length and Breadth.

It was also, when in the aforesaid State and Condition, the Mother River and Outfall for the Drainage not only of the low Grounds and Fens aforesaid, but also of the low Grounds of *North Kyme Fen, South Kyme Fen, Hart's Grounds, Great and Little Beets, Rakes, Heckington Fen, Lady Frazer's 600 Acres, Ewerby, Howel, Asgarby, Great and Little Hales, Brothertoft, Anwick, Ruskington, Dorrington, Digby, Mareham, Hundle-house, Revesby, Middleham, Moor-House, Meer Booth, Hermitage, Newholme, West-House Langrike, Fritb Bank, Langworth, Swine-cote, Stickford and Stickney*; and also of many other low Grounds and Fens lying more distant and remote therefrom (but having their Outfalls for Drainage into it) containing in the Whole by Estimation, upwards of 100'000 Acres.

It's Utility when drained

This once so flourishing River and Country have for many Years last past been falling into Decay, by the Banks of the said River being suffer'd to become Ruinous and incapable of sustaining and confining the Water in times of high Country Floods, so that those Flood

It's present bad State and condition

Waters

Some Reasons
assigned for the
decay of this
River.

Waters which were necessary and used heretofore, by their Velocity and Weight, to cleanse out the Sand and Sediment brought up by the Tides, have been and now are suffer'd to run out of their antient and natural Course and expand over the adjoining Fens and low Grounds, whereby those Sands, for want of a refloving Power of adequate Force to carry them back, have now so much choaked up the Haven from *Boston* to the Sea, that for several Years last past the Navigation thereof has been lost for Shipping, and it is now become even difficult for Barges of about 30 Tons burthen to get up to the Town in neap Tides. And for several Miles above the Town of *Boston* the said River is totally lost, insomuch that it's Bottom is in many Parts some Feet higher than the adjoining Low Grounds, and the Scite thereof converted into Grazing and Farming Purposes..

This mischievous Effect has not only been destructive to the Navigation of that River but also to the Drainage of the aforesaid vast Tracts of Fens, and low Grounds, by reason that

many

many of the Mouths of the inward Drains, Dikes, and Sewers, which shou'd have their Outfalls into this River, are totally landed up, and lost, and have not run at all for many Years into it ; and the few that have their Outfalls so low as *Boston*, and below it, are nevertheless in all dry Seasons so much choaked up and obstructed, that the said Fens and low Grounds must be in some parts considerably under Water, before they can have vent through their Outfalls into the said River, or Haven, whereby the Flood Waters lye so long stagnant thereupon as to destroy the Herbage thereof, and render them not only useles and unprofitable but also extreamly noxious and unwholesome to the adjacent Inhabitants.

Some Reasons
assigned for the
loss of Drainage

To find out proper and necessary Expedients to improve this River and Fens, Surveys and Levels were taken some Years ago from *Wiberton Roads* to *Lincoln* not only along the Course of the said River, but also on the adjoining Fens and low Grounds to compare their different Surfaces both with respect to the said

River

Means used to
find out proper
Expedients to
restore Drain-
age and Navi-
gation on this
River

River and their Outfalls to Sea ; In consequence of which a Scheme was formed and published in the Year 1744 by Mefs. *Grundy's* Engineers, recommending such Expedients as to them at that Time appeared proper for effecting the above desirable purposes ; Upon which several Meetings have from time to time been held to consider this and other Schemes, and many Clauses were prepared for a Bill particularly at a Meeting held at *Lincoln* in November 1753 and others subsequent thereto.

In the Year 1760 Mr. *Langley Edwards* was employ'd to make Views of the Premises in Question, and since then Mr. *Grundy* the Son has resurvey'd the River and Fens and both have made their several Reports thereupon, which said Surveys, Levels, Resolutions, and Reports being duly consider'd, and a fresh View taken of the River and Fens in October 1761 by Mefs. *Grundy* and *Edwards* in Conjunction with Mr. *John Smeaton* Engineer, We the said *John Grundy* *Langley Edwards* and *John Smeaton* are jointly of Opinion as follows Viz.

R E P O R T

REPORT

In the first Place it appears to us that from the great tendency of this River to Silt, and the great advance the same has made in the space of twenty Years, that in all human probability within the compass of a few Years more, not only the Outfalls of the present effective Drains near *Boston* will be totally lost, but the whole River landed up, unless sufficient Measures are speedily taken to prevent it, and the most eligible means for so doing we conceive will be to make and preserve a Mother River of sufficient depth and Capacity to effect a general Drainage of the several Fens and low grounds afore said, and also to restore this lost Navigation from the Sea through *Boston* to *Lincoln*, and into the *Brayford Meer* (which has navigable Communication through the *Fosfdike* with the River *Trent*) upon the following principles and by the following Methods.

Motives to induce a speedy Execution

Proposals for a Mother River

It's Situation First. That the new proposed River be made in the shortest Direction that can be, consistent with the lowest Surface of the Country, consider'd in a medium proportion, and most convenient for receiving the Waters thereof.

Dimensions Secondly. That it's Dimensions be such as to be capable of receiving, and discharging, not only all the upland Waters, but also all those of the several Branch Rivers and Drains that fall into it.

Banks Thirdly. That it's Banks be made of sufficient strength and height to confine the Flood Waters within them, and to force them down to Sea without overflowing the adjoining Fens and low Grounds.

It's Bottom Fourthly. That it's Bottom be made with a regular declivity from *Lincoln* to the Sea, which according to the Levels will be at a medium near $5 \frac{1}{2}$ Inches per Mile.

Fifthly. To collect all the living Waters into this new River that can be obtained,

scouring

scouring out and imbanking all side Rivers, Rivulets, and Brooks that bring down such living Waters out of the high Country into it, in order to obtain a reflowing Force that shall be capable of driving out such Matter as is left by the Tides, by which means only, the Outfall below can be preserved open, and clean.

Means to keep open the Outfall

Sixthly. To stop the Tides from flowing at all into this New River, that it's depth and Dimensions may be preserved.

Stopping the Tides

Seventhly. That this Work shall be so constructed that Navigation may be carried thereon so as in no wise to interfere with or prejudice the Drainage.

Navigation thereon

Eightly. That the necessary Works be constructed to retain the fresh Water, to be made use of as occasion shall require, for the well watering the said Fens and low Grounds in dry Seasons for the use of Cattle &c.

Means to Water the Fens &c.

And Lastly. That no Salt Water be admitted into the Mother River, or Drains, above Boston by means of the proposed Navigation.

To prevent the Salt Water getting therein.

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The SCHEME for the DRAINAGE.

The Sea Sluice First. To erect a Sea Sluice for stemming the Tides between *Lodowicks Gowt* and *Boston Bridge* and we recommend a Piece of Ground commonly called *Harrison's* four Acres at (A) (see the Plan for that purpose) the Flood whereof to lye level with low Water Mark at *Wibberton Roads*, and it's neat Capacity or clear Waterway to be 50 Feet, with three Pair pointing Doors to the Seaward to shut with the flow of the Tides, and drop or draw Doors on the Land Side to be shut occasionally, to retain fresh Waters in dry Season. The Top of these draw Doors to be gaged such a height as to retain the Water of the River, not higher, at ordinary Seasons, than two Feet below the Surface of the lowest Land that drain therein.

Secondly. To make a new Cut from the Sluice to or near *Anthony's Gowt*, (A B) as straight a direction as the nature of Ground

Ground will admit of ; 80 Feet broad at the Top, 50 Feet broad at the Bottom, and Ten Feet deep : and from the said Place at or near *Anthony's Gowt* to make a new Cut (in as straight a direction also as the nature of the Ground will admit of) through *Wildmore Fen* to *Chappel Hill* (C) at a medium, 66 Feet wide at Top, 50 Feet wide at Bottom, and 8 Feet deep. The Earth coming out of this new River to be disposed of in forming Banks which are proposed to be set 40 Feet distance from the Brink of the River.

The new Cut
to Chappel Hill
and Banks

Thirdly. The River from the upper end of this new Cut at *Chappel Hill* to *Lincoln* is proposed to be continued in it's present Course, but the shallow parts thereof to be scoured out, and deepen'd, where necessary, so as to be every where of the following Dimensions at a medium Viz.

From Chappel
Hill to Lincoln

For three Miles and a half above *Chappel Hill* 60 Feet broad at the Top, 40 Feet broad at the Bottom, and $5\frac{1}{2}$ Feet deep below the present Bottom. From thence to *Washingborough Lordship*, above *Branston Dyke*, (being about $12\frac{1}{2}$ Miles) this River (having the Waters of several

From Chappel
Hill to Lincoln

several Rivulets and Brooks to receive within those Limits) should be 40 Feet wide at the Top, 30 Feet wide at the Bottom, and 2 Feet deeper than it's present Bottom at a medium. From hence to *Stamp End* in *Lincoln* (being about 10 Miles) to deepen the Sholes in the old River, so as to be 30 Feet broad at the Top, 24 Feet broad at the Bottom and $2\frac{1}{2}$ Feet deeper than they now are on an Average.

Bridges, Gates
and Fences

Fourthly. To make and erect One Waggon Bridge at (D) and two Horse Bridges, (E and F) with necessary Gates and Fences for continuing the Roadway and other Communications, and for dividing the *Wildmore* and *West Fens* from *Holland Fen*.

Kyme Eau

Fifthly. To scour out and imbank *Kyme Eau* from *Dampford Sluice* to the River, or so much further as may be found necessary, So that it's Banks may be 30 Feet Seat, 6 Feet at the Top, and 6 Feet high.

Tattershall bane

Sixthly. To scour out *Tattershall Bane* from the mouth thereof to *Dickinson's Engine* and repair the Banks thereof so as to be 30 Feet Seat, 6 Feet at the Top, and 6 Feet high.

Seventhly.

Seventhly. To scour out and imbank *Billinghay Skirth* from the *Witham* to *Billinghay Town*, so that it's Banks may be of the same Dimensions as the former, and also to scour out and imbank the Skirth from *Billinghay Town* to *Kyme Causeway Bridges*, so as to be of proportionable Dimensions for Draining the low Grounds above the said Causeway.

Eightly. To scour out *Barlings Eau* from the River to *Barlings Abby* and repair the Banks thereof so as to be 15 Feet Seat, 5 Feet at the Top and 5 Feet high; and also to dike out and imbank *Stainfield Beck* proportionable to the former.

Ninthly. To scour out and imbank *Dunsdike*, from the River *Witham* to the *Carr Dike* (or instead thereof to reinstate the *Carr Dike*, and turn it's Waters therein) so that it's Banks may be 15 Feet Seat, 5 Feet at the Top, and 5 Feet high.

Tenthly. To scour out and imbank *Nocton Dike* and *Hares Head Drain* from the River to the *Carr Dike*, so that it's Banks may be 12 Feet Seat, 4 Feet at the Top and 4 Feet high.

Eleventhly.

Washingbo-
rough Beck

Eleventhly. To scour out and imbank *Washingborough Beck* from the River to the *Carr Dike* of the same Dimensions as the last.

Tupham Dike
&c.

Twelfthly. To scour out *Tupham Dike*, *Bardney* or *Tilehouse Beck*, *Southery Eau*, and *Stixwold Beck*, and imbank the same proportionate to the Flood Waters they bring down.

Lodowicks
Gowt

N. B. *Lodowicks Gowt* will be wanted for discharging the River Waters during the execution of the Work.

Anthony's new
Gowt

And for the more certain Drainage of *Wildmore* and *West Fens*, a new Cut and Sluice to supply the Place of *Anthony's Gowt* be made and erected by the side of the said new proposed River, and that the Floor thereof be laid as low as the Bottom of the said River.

Conclusion
of the Scheme
for Draining

When the Works above recommended are put in practice, and have had the necessary Time to produce their effects upon the Out-fall ; We are of Opinion, that the Surface of the Water in the New River will be capable of running at least four Feet lower at ordinary Seasons, than at present it can do, and consequently

frequently that not only all the Lands lying immediately thereupon will be put into a condition of effectual Drainage, but also such Parishes which at present Drain by *Engines* into *Holland Fen*, or into the several Sewers bordering thereupon. and will likewise be of service in affording a more ready discharge of the down-fall Waters from the Lands lying still further from their Outfall.

The S C H E M E for N A V I G A T I O N. viz.

First. To erect a Lock with two pair of Doors pointing to the Landward for the purpose of Navigation, and One pair of Doors pointing to Seaward to keep out the Tides. The Sea Lock

Secondly. Upon mature Consideration and comparing the advantages and Utility with the increase of Expence we are of Opinion that Locks are greatly preferable to Staunches, tho' the Expence of the former will be considerably more than the latter. We therefore propose to

C

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Washingbo-
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Tupham Dike
&c.

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C

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The other Locks
and Wares

erect three Locks in proper Places by the Side of the Mother River betwixt the Sea Sluice and the City of *Lincoln*, to retain the Waters therein for the purposes of Navigation in dry Seasons (which at the same time will be subservient to the watering of Cattle) and One above *Sincil dike* in *Lincoln* to communicate the Navigation of the *Witham* with the *Fossdike* but that the said Locks may not be prejudicial to Drainage, in wet Seasons, the three former are to be so limited in their height that they shall not retain the Waters of the main River any higher than within two Feet of the natural Surface of the lowest Grounds above them ; and the Wares or Wastes appertaining thereto shall be composed of Flood Gates, which together shall be of the same Capacity with the River in the respective Parts where such Locks are to be erected. and the latter (proposed to be erected above *Sincil dike*) shall be limited to such height, as not to penn the Waters higher than the present natural Staunch at *Brayford Head*, and that a Waste or Ware be erected at the upper Mouth of *Sincil dike* at G at the same level with this Lock, so that no prejudice may be occasioned thereby to the present State

of the *Fossdike* Navigation, or to the low Grounds
above *Lincoln*.

Thirdly. For the carefull and safe manage-
ment of the Locks, and that the waste Gates
may be at all times opened upon the approach
of any Flood, or when the River is overcharg- Watchmen
ed with Water. A dwelling House is proposed
to be built against each Lock, and a Watch-
man to be fixed in each to take care thereof.

Fourthly. To deepen the Bed of the River
betwixt Staunch and Staunch sufficient for the Deepening the
purpose of Navigation which at a medium will Bed of the River
be about 13 Inches. which done will make 3
Feet Navigation.

Fifthly. To make proper Halingways for
Men and Horses on the Banks and Forelands of
the said River, and that no damage may be done Halingways
thereby, proper Gates Bridges Styles and Fences
be put down betwixt property and property
through which the said Halingways may lead.

An ESTIMATE of the EXPENCES that will probably attend the Execution of the foregoing proposed Works. viz. —

The SCHEME for DRAINAGE.

<p>THE Sea Sluice near <i>Boston</i> to be laid level with the low Water Mark at <i>Wibberton</i> Roads (which is 3 Feet 1 Inch and 9 Parts lower than <i>Lodowick's Gowt</i>) with a Timber Floor supported by Dovetail and bearing Piles, Braces and Tyes, with a Superstructure of Brick and Stone, with three Arches to contain 50 Feet neat Waterway, the Sea and Land Doors of Oak, &c. &c.</p>	<p>£. S. D</p> <p>4000 0 0</p>
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<p>To making the new Cut from this Sluice to or near <i>Anthony's Gowt</i> (being 760 Rood's at 20 feet to the Rood) so as to be 80 feet broad at the Top, 50 feet broad at the Bottom and 10 feet deep at a medium, will contain $32\frac{1}{2}$ Floors in a Rood, and for the whole Length 24'700 Floors, which as the Earth is to be barrowed to the Distance of 40 feet from the Brink of the River on each side, and laid in Bank fashion, and on Account of the great Depth of the said Cut, will cost about 5s. per Floor (or 400 Cubical feet) and comes to</p>	<p>6175 0 0</p>
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Carried Over	£. 10' 175 0 0
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Brought over £. S. D.
 £ 10'175 0 0

The inclosed Land to be cut through will
 contain about 6 Acres which at 30 £ per Acre } 180 0 0
 Comes to

The Forelands and Cover of the Banks will
 contain about $13\frac{1}{2}$ Acres which at 15 £ per } 202 10 0
 Acre is

The Commons to be Cut through will con- } 220 0 0
 tain 22 Acres which at 10 £ per Acre is

The Forelands and Cover will be $49\frac{1}{4}$ } 246 5 0
 Acres which at 5 £ per Acre is

To taking away the old Banks and cutting } 200 0 0
 across the old River

To erecting a New Sluice at *Anthony's Gowt* } 600 0 0
 and making the communication Cut

To making a new Cut across *Wildmore Fen*
 from or near *Anthony's Gowt* to *Chappel Hill*
 (being 1848 Roods) 66 feet broad at the
 Top, 50 feet broad at the Bottom and 8 feet } 8574 14 5
 deep on an Average, will contain 232 Floors
 in a Rood and for the whole Length 428'73,6
 Floors which at 4s. per Floor Comes to

Carried Over £ 20'398 9 5 /

£. S. D.

Brought Over £ 20' 398 9 5

The Land to be cut through will contain }
 56 Acres of Common Fen Land which at } 560 0 0
 10 £ per Acre comes to }

The forelands and Cover of the Banks will }
 contain 136 Acres, which at 5 £ per Acre } 680 0 0
 Comes to }

To scouring out three Miles and a half a- }
 bove *Chappel Hill* so as to be 60 feet broad at }
 the Top, 40 feet broad at the Bottom and 5 }
 $\frac{1}{2}$ feet deep below the present Bed, will con- } 2541 0 0
 tain $13\frac{3}{4}$ Floors in a Rood, and for the whole }
 Length (which is 924 Roods) 12' 705 Floors }
 which at 4s. per Floor comes to }

To Diking out the old River where neces- }
 sary and imbanking the same from thence to }
Lincoln, being in Length $22\frac{1}{2}$ Miles, which } 3375 0 0
 being estimated at 150 £ per Mile at a me- }
 dium Comes to }

To erecting a Waggon Bridge over the new }
 River in the Road from *Langrike Ferry* to }
Horncastle, and two other Bridges for com- }
 munication of the Cattle for the use of the } 1000 0 0
 Commons, and to making good the Fencing }
 betwixt *Wildmore* and *West Fens* and *Holland* }
Fen about }

Carried Over £ 28' 554 9 5

		£.	S.	D.
	Brought Over	£	28'554	9 5
To repairing <i>Lodowicks Gowt</i> and making proper Cuts to discharge the Water during the Work, leaking out Water in the Reaches &c.			1400	0 0
To Materials of Barrows and Planks, Tref- fells Gang Ladders, Engines and other Uten- sils &c. and Carriage of them to the Work			1200	0 0
To scour out and imbank <i>Kyme Eau</i> from <i>Dampford Shuice</i> to the River, and repairing the Banks thereof according to the Scheme			1000	0 0
To Ditto of <i>Tattershall Bane</i> , of the same Dimensions as the last, from the <i>Witham</i> to <i>Dickinson's Mill</i>			300	0 0
To Ditto of <i>Billinghay Skirtbs</i> from the <i>Witham</i> to <i>Billinghay Town</i> , and from thence to <i>Kyme Causeway Bridges</i> as per Scheme			800	0 0
To Ditto of <i>Barling's Eau</i> and <i>Stainfield Beck</i> and repairing the Banks thereof to the Di- mensions mentioned in the Scheme			500	0 0
To scouring out and imbanking <i>Dunsdike</i> (or the <i>Carr dike</i>) as directed in the Scheme			400	0 0
	Carried Over	£	34'154	9 5

	£.	S.	D.
Brought Over	£ 34	154	9
To Ditto of <i>Noeton Dike</i>	275	0	0
To Ditto of <i>Washingborough Beck</i>	60	0	0
To Ditto of <i>Tupham Dyke, Bardney or Tilehouse Beck, Southery Eau and Stixwold Beck</i>	360	0	0
To unforeseen and Incidental Contingencies Supervising, and Officers to attend this Work.	3000	0	0
Total for the Works of general Drainage.	£ 37	849	9

An ESTIMATE

An ESTIMATE of such Works as concern NAVIGATION only. viz.

	£.	S.	D.
To making and erecting the fide Lock or penn Sluice as proposed in the Scheme }	1200	0	0
To Building 3 Locks with proper wastes and Flood Gates as per Scheme between <i>Chappel Hill</i> and <i>Lincoln</i> }	2000	0	0
To three Watch-houses and purchasing the Ground }	150	0	0
To erecting the proposed Lock in <i>Lincoln</i> above <i>Sincil Dike</i> as per Scheme }	400	0	0
There will also be a necessity to deepen the Bed of the Mother River for the purposes of Navigation, over and above what is required for Draining upon an average 13 Inches from <i>Chappel Hill</i> to <i>Lincoln</i> which is $26\frac{1}{2}$ Miles and will cost about 80 £ per Mile and comes to }	2120	0	0
And for deepening the Passage from the Lock above <i>Sincil Dike</i> through the high Bridge into <i>Brayford Meer</i> }	200	0	0

Carried Over £ 6070 0 0

£ S. D.
Brought Over 6070 0 0

To Materials of Barrows and Planks, Engines, Gang Ladders, Treffells &c. for this Work } 500 0 0

To unforeseen Contingencies and Supervising the Works } 800 0 0

Total for Navigation £ 7370 0 0

John Grundy.

Langley Edwards.

J. Smeaton.

SLEAFORD,

November 23d, 1761.

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MVSEVM
BRITANNICVM

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